Patent Claims

1. A method for operating an air conditioning system (1) of a vehicle, in which a fluid (F) for conditioning an air stream (2) is circulated in a circuit (8) operable in the cooling or heating mode, **characterized** in that, in the heating mode, the circuit comprises a condenser (26), a heat exchanger (24) and an intermediate store (28), the circuit being controlled in such a way that the intake pressure of the condenser (26) at least partially overshoots a saturation pressure in the circuit caused by the ambient temperature.

2. The method as claimed in claim 1, characterized in that the heating mode corresponds to an operation of the circuit in a dextrorotary triangulation process, in which the exit of the condenser is connected to an entry of a control valve (38a), connected on the exit side to the heat exchanger (24) which is followed on the exit side by the intermediate store (28) and the entry of the condenser (26).

3. The method as claimed in claim 1 or 2, characterized in that the intake pressure can be controlled in a range of 10 bar to 110 bar.

4. The method as claimed in one of claims 1, 2 or 3, characterized in that, in the heating mode, the fluid (F) in the circuit can be divided into at least one active part (8B) and at least one passive part (8A).

5. The method as claimed in one of claims 1 to 4, characterized in that, with the activation of the heating mode, the fluid (F) is routed out of the passive part of the circuit (8A) into the active part of the circuit (8B).

6. The method as claimed in one of claims 1 to 5, characterized in that, when a predeterminable threshold value for the intake pressure in the active part of the circuit (8B) is undershot, the fluid (F) is routed out of the passive part of the circuit (8A) into the active part of the circuit (8B).

7. The method as claimed in either one of claims 5 and 6, characterized in that, to transfer the fluid out of the passive part of the circuit into the active part of the circuit, the circuit operated in the heating mode is changed over to the cooling mode.

8. The method as claimed in either one of claims 5 and 6, characterized in that, to transfer the fluid out of the passive part of the circuit into the active part of the circuit, the circuit operated in the heating mode is changed over to a laevorotatory triangulation process.

9. The method as claimed in either one of claims 7 and 8, characterized in that the circuit can be operated in the cooling mode or in the laevorotatory triangulation process up to the undershooting of a settable threshold value, the circuit being capable of being changed over to the heating mode again after the undershooting of the threshold value.

10. The method as claimed in claim 9, characterized in that the threshold value for an intake pressure and/or for a high pressure and/or for a hot-gas temperature at the condenser can be predetermined.

11. The method as claimed in claim 9, characterized in that the threshold value of the intake pressure is set at least 3 bar, preferably 5 bar, below the value of the saturation pressure caused by the ambient temperature.

12. The method as claimed in one of claims 7 to 11, characterized in that the circuit can be operated in the cooling mode or in the laevorotatory triangulation process for a predeterminable period of time, the circuit being capable of being changed over to the heating mode again after the expiry of the period of time.

13. The method as claimed in one of claims 7 to 12, characterized in that an air stream (2) through the evaporator can be reduced after the changeover to the cooling mode or to the laevorotatory triangulation process.

14. The method as claimed in one of claims 7 to 13, characterized in that an air stream through a gas cooler can be reduced after the changeover to the cooling mode or to the laevorotatory triangulation process.

15. The method as claimed in one of claims 10 to 14, characterized in that a pressure equalization can be carried out in the circuit after the return to the heating mode.

16. An air conditioning system (1) for a vehicle with a circuit (8), operable in the cooling or heating mode, for the circulation of a fluid (F) for conditioning an air stream (2), **characterized** in that, in the heating mode, the circuit comprises a heat exchanger (24), an intermediate store (28) and a condenser (26) for the intermediate storage or for the condensation of the fluid (F), the condenser being operated at an intake pressure which is higher than the saturation pressure in the circuit (8) caused by the ambient temperature.

17. The air conditioning system (1) as claimed in claim 16, characterized in that the an evaporator (6) inserted in the flow duct (4) of the air stream (2) on the secondary side and in the circuit (8) on the primary side is provided, which is connected in the circuit (8), on the exit side, to the intermediate store (28), with a nonreturn valve (36) being interposed.

18. The air conditioning system (1) as claimed in claim 17, characterized in that the volume of the evaporator (6) for fluid reception is smaller than the storage volume of the intermediate store (28).

19. The air conditioning system (1) as claimed in claim 18, characterized in that the ratio of the storage volume of the intermediate store to the volume of the evaporator lies in the range of 2:1 to 20:1, preferably in the range of between 2:1 and 10:1.

20. The air conditioning system (1) as claimed in one of claims 16 to 19, in which a control device (38B) is arranged between the heat exchanger (24) and the intermediate store (28).

21. The air conditioning system (1) as claimed in one of claims 16 to 20, in which a pressure sensor is assigned on the intake side to the condenser (26).

22. The air conditioning system (1) as claimed in one of claims 16 to 21, in which the circuit (8) is subdivided into at least one active and at least one passive part.

23. The air conditioning system (1) as claimed in claim 22, in which the active part is connected to the passive part by means of a further control device (38C), the control device (38C) being opened when the

fluid quantity in the active part of the circuit overshoots a predeterminable threshold value.

24. The air conditioning system (1) as claimed in one of claims 19 to 23, in which the condenser (26) is connected to the evaporator (6) on the exit side via a control means (42) and on the entry side via an associated controllable connecting line (40), after the opening of the control means gaseous fluid (F) passing into the evaporator and forcing liquid fluid (F) out of the evaporator into the active part (8B) of the circuit.